

ABSTRACT OF THE DISCLOSURE

An assembly and planar structure for use therein which is expandable into a 3-D structure such as a stent and device for making the planar structure are provided. The planar structure permits the use of planar batch manufacturing technologies to fabricate coronary artery stents. Stents with different wall patterns are fabricated from 50 μm thick stainless steel foil using micro-electro-discharge machining, and expanded to tubular shapes by using angioplasty balloons. The stents are free-standing. The free-standing stents exhibit diameter variations of $< \pm 4\%$, almost zero radial recoil after deflation of the balloon, and longitudinal shrinkage of $< 3\%$ upon expansion. A variation of the stents uses breakable links to provide additional customization of electrical and mechanical properties. Loading tests reveal that the radial strengths match commercially available stents, while longitudinal compliance, at 0.02 m/N for a 4 mm long section of the stent, is substantially higher.